

CLAIMS

1. A process for preparing a fluorine-containing elastomer, which is a batch copolymerization process conducted under conditions  
5 that the reduced temperature of the critical constant is at least 0.95 and the reduced pressure of the critical constant is at least 0.80 wherein the reduced temperature and the reduced pressure are calculated using the Peng-Robinson formula from the critical temperature, the critical pressure and the composition ratio of each of the monomers in the  
10 gaseous phase in the reaction vessel,

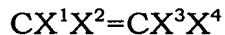
wherein ethylenically unsaturated compounds containing at least one fluoroolefine are copolymerized in the presence of a compound having the formula:  $R_f^1 \cdot I_x$  wherein  $R_f^1$  is a saturated or unsaturated fluorohydrocarbon or chlorofluorohydrocarbon group having 1 to 16  
15 carbon atoms, and  $x$  is the number of bonds of  $R_f^1$  and an integer of 1 to 4.

2. The process for preparing the fluorine-containing elastomer of Claim 1, wherein the inner pressure of the vessel during  
20 the polymerization is at least 3 MPa.

3. The process for preparing the fluorine-containing elastomer of Claim 1 or 2, wherein the number of particles of the fluorine-containing elastomer is at least  $5 \times 10^{13}$  per 1 g of water when  
25 the polymerization is finished.

4. The process for preparing the fluorine-containing

elastomer of any of Claims 1 to 3, wherein the fluoroolefine is a compound having the formula:

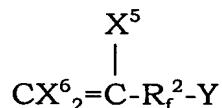


5

wherein  $X^1$  to  $X^3$  are each a hydrogen atom or a halogen atom, and  $X^4$  is a hydrogen atom, a halogen atom, a carboxyl group, an alkyl group having 1 to 9 carbon atoms in which a part or all of the hydrogen atoms are substituted by fluorine atom and which may include an 10 ether bonding oxygen atom, or an alkoxy group having 1 to 9 carbon atoms in which a part or all of the hydrogen atoms are substituted by fluorine atom and which may include an ether bonding oxygen atom, and wherein the fluoroolefine contains at least one fluorine atom.

15

5. The process for preparing the fluorine-containing elastomer of any of Claims 1 to 3, wherein the fluoroolefine contains a compound selected from the group consisting of hexafluoropropylene, tetrafluoroethylene, trifluoroethylene, pentafluoropropylene, vinyl fluoride, hexafluoroisobutene, perfluoro(alkyl vinyl ethers), 20 polyfluorodienes and a compound having the following formula:



wherein Y is  $-CH_2I$ ,  $-OH$ ,  $-COOH$ ,  $-SO_2F$ ,  $-SO_3M$  in which M is 25 hydrogen,  $NH_4$  group or an alkali metal, a carboxylic acid salt, a carboxylic ester group, an epoxy group, a nitrile group or an iodine atom,  $X^5$  and  $X^6$  are the same or different and each is a hydrogen atom

or a fluorine atom,  $R_f^2$  is a bivalent fluorine-containing alkylene group having 0 to 40 carbon atoms which may include an ether bonding oxygen atom.

5                 6. A fluorine-containing elastomer which is obtained by the preparation process of any of Claims 1 to 5 and has a Mooney viscosity of at least 30 at 100°C.

10                 7. A peroxide vulcanizable fluorine-containing elastomer comprising 20 to 90 % by mole of vinylidene fluoride repeating units and 10 to 80 % by mole of hexafluoropropylene repeating units;  
15                 (a) which contains 0.01 to 10 % by weight of an iodine atom in the elastomer,  
                   (b) which has a number average molecular weight of from 1,000 to 300,000,  
                   (c) which has a VdF branch ratio of at most 200 ppm, the ratio being calculated from the following formula:

---

$$\frac{\text{an area from } \delta F -96.5 \text{ to } -99.5 \text{ ppm}}{3 \times (\text{an area from } \delta F -88.0 \text{ to } -124.0 \text{ ppm})}$$

20                 in which an acetone solution having a polymer concentration of about 20 % is subjected to measurement on high-resolution  $^{19}F$ -NMR.

25                 8. The fluorine-containing elastomer of Claim 7, which gives a molded article by vulcanization having an elongation at break  $E_b$  of at least 200 % and at most 550 %, and a compression set CS of

at least 5 % and at most 30 % at 200°C for 72 hours.

9. A fluorine-containing elastomer curable composition comprising the fluorine-containing elastomer of Claim 7 or 8 and a  
5 curing agent.